PROCEDURE: DVOurInfo_Proc(*n', k, d, m, c*), also see Fig. 15

```
Begin
        If self ≠ k                          /* error */
                Drop the frame
        Else
                d(self, n') :=d ;
                F(self, n') := p_r(self) ;
                next(self, n') := n' ;
                FG_A(self, n') := 1 ;
                FG_T(self, n') := 1 ;
                FG_R(self, n') := 1 ;
                dsanc(self) := m ;
                dcc(self) := c
        endif
end
```

Pseudocode 2: DVOurInfo_Proc

PROCEDURE: DVInform_Proc(*k, j, d*), also see Fig. 16.

```
Begin
        If j = self                                                   /* Case 3.1 */
                d(self, k) := d ;
                FG_A(self, k) := 1
        Else If d(self, k) is unknown or d(self, j) is unknown        /* Case 3.2 */
                Drop the frame
        Else if FG_A(self, j) = 0                                     /* Case 3.3 */
                If parent(self) = dsanc(self)                         /* Case 3.3a */
                        d(self, j) := c(self, parent(self)) + (d – dcc(self)) ;
                        FG_A(self, j) := 1 ;
                        Send DVInform frame < self, j, d(self, j)> to j
                Else                                                  /* Case 3.3b */
                        d(self, j) := (d(self, k) – dcc(self)) + (d – dcc(self))
                endif
        endif
end
```

Pseudocode 3: DVInform_Proc

III.B Distance Vector Enhancement

The DV Enhancement procedure is similar to the distance vector exchange procedure in the traditional approach except that we can replace a tree path only if its exact distance is known. That is, $d(n, n')$ in the distance vector can be replaced only if $FG\_A(n, n') = 1$ or $FG\_T(n, n') = 0$. On the other hand, if a tree path from n to n' is found and $d_T(n, n')$ is only an estimate, it replaces $d(n, n')$ in the distance vector. After the DV Estimation procedure, bridge n only knows the tree distance, either correct or estimate, to its tree neighbors and distant STAR neighbors. In order to let a bridge identify whether a path to a formerly unknown bridge is a tree path and whether the tree path distance is correct, the accuracy flag and the tree path flag must be put in the DVRecord frames. The format of a DVRecord(n, n') frame sent by bridge n is <*n, n', d(n, n'), FG_A(n, n'), FG_T(n, n'), FG_R(n, n')*>. Pseudocode 4 is the DV Enhancement procedure of STAR bridge *self* upon receiving DVRecord(j, k) frame <*j, k, d, FG_A, FG_T, FG_R*>. FIG. 17 shows the flow-chart corresponding to Pseudocode 4 (DVRecord_Proc).

In Pseudocode 4, when the path from *self* to j and the path from j to k are both tree paths, the path from *self* to k through j must be a tree path too. This is Case 4.1. FG_R(self,k) flag is updated accordingly and the tree path information is sent to other STAR neighbors so that the other STAR tree neighbors discover the tree path leading to k. If the tree path distance is an estimate, it always replaces the existing *DVT(self, k)*; otherwise, it replaces only if it is better in terms of distance. Case 4.2 is the case where a non-tree path is found. If the existing *DVT(self, k)* is not an estimated tree path, it can be replaced if the newly found path is shorter. After the algorithm converges, the distance vector can be reduced to the BF Table. Bridge n has to keep $F(n, n')$ and $next(n, n')$ for every bridge $n' \in B\backslash\{n\}$ for forwarding purpose. A path in the BF Table between a pair of STAR bridges is referred to as a STAR forwarding path. Note that a STAR forwarding path may be a standard tree path or an enhanced forwarding path when it can be identified.

PROCEDURE: DVRecord_Proc(*j, k, d, FG_A, FG_T, FG_R*), also see Fig. 17.

```
Begin
        If k is unknown                                 /* k is newly discovered */
                DVT(self,k) := (∞,p_r(self), j, 0, 0, 0)  /* initialize DVT (self, k) */
Endif

        If FG_T(self, j) = 1 and FG_T = 1               /* Case 4.1: a tree path to k is found */
                If FG_R(self, j) = 1 and FG = 1         /* k is an ancestor of self */
                        FG_R (self, k) := 1
                Else if FG_R (self, j) = -1 and FG_R = -1     /* k is a descendant of self */
                        FG_R (self, k) := -1
                endif
```

```
                If  FG_A (self, j) = 0 or FG_A = 0          /* tree path distance is a estimate */

                        FG := 0
                        DVT (self, k) := (d(self, j) + d, F(self, j), j, 0, 1, FG_R (self, k))
                Else
                        FG := 1
                Endif

                Send DVRecord <self, k, d(self,j) + d, FG, 1, FG_R (self,k)>
                        to all STAR neighbors except j

                If d(self, j) + d < d(self, k)              /* tree path distance is correct and better */
                        DVT(self, k) := (d(self, j) + d, F(self, j), j, 1, 1, FG_R(self, k))
                endif



        Else                                                /* Case 4.2: a non-tree path is found */
                If FG_A(self, k) = 1 or FG_T(self, k) = 0   /* original path can be replaced */
                        If d(self, j) + d < d(self, k)
                                DVT(self, k) := (d(self, j) + d, F(self, j), j, 1, 0, FG_R(self, k))
                                Send DVRecord < self, k, d(self, k), 1, 0, FG_R(self, k)> to
                                        all STAR neighbors except j
                        endif
                endif
        endif
end
```

Pseudocode 4: DVRecord_Proc

IV. STAR learning process

When the path finding process is done, a STAR bridge should have filled its BF Table. It then starts the STAR learning process and the STAR forwarding process to forward data frames. The BF Table alone is not enough to forward a data frame since the data frame contains the address of an end station instead of a bridge. Therefore, the STAR learning process has to learn the location of end stations and store the information. An ESL Table is used to map end stations to STAR bridges.